TECHNICAL MANUAL

RAIN REPELLENT
FOR APPLICATION TO WINDSHIELDS
ALL AIRCRAFT

(ATOS)

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TOTAL NUMBER OF PAGES IN THIS MANUAL IS 10, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
Title	0				
A	0				
i - ii	0				
iii	0				
iv Blank	0				
1-1	0				
1-2 Blank	0				
2-1	0				
2-2 Blank	0				

*Zero in this column indicates an original page

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

1. PURPOSE.

The purpose of this manual is to identify the recommended water repellent for use on all aircraft glass and/or plastic surfaces. The water repellent can be used on all windows and windshields, glass, and plastic surfaces. The specification for the water repellent was adopted by the Department of Defense (DoD) on 30 September 1999.

2. SCOPE.

This manual will cover the specification used to identify the water repellent and the National Stock Number (NSN) used to order it from supply. The general use and reasons why this is the recommended water repellent for the Air Force, is the aircraft specialist or technician will be instructed on how to apply the recommended water repellent and how to test the surfaces to see when reapplication.

3. SAFETY.

The recommended water repellent for the Air Force is not to be used for removing snow, ice, or frost already on aircraft windshield and windows. Use the water repellent only in a well-ventilated area. This product contains flammable isopropyl and alcohol. Keep away from fire or other ignition sources.

CHAPTER 1
GENERAL INFORMATION

1.1 GENERAL.

In the past pilots of aircraft when encountering rainstorms have suffered loss of visibility because normal vision is obscured and distorted by the torrents of rain that strike the windshield. In addition to obstructing vision, the rain causes an apparent lowering of the horizon by 10° or more, which could cause the pilot to fly into the ground. To eliminate this condition, a chemical rain repellent is authorized for use. The rain repellent, if properly maintained, will provide improved visibility without the use of other rain removal devices, or it can be used to supplement the action of windshield wipers or the JET BLAST rain removal systems used on aircraft. The rain repellent forms an invisible film, which is NON-WETTING with respect to water, over the windshield or glass. Raindrops impinging the repellent film, during flight, beads into small drops which are rapidly swept away by the airstreams running over the surface resulting in an improvement in the pilot's vision. The windshields and windows on our modern jet aircraft are made up of different materials other than just glass, which are very expensive. The Air Force Technician has to insure that the right materials are used for cleaning and maintaining these aircraft windscreens to avoid damaging them and causing untimely replacement of them. The Air Force has required any rain repellent used on aircraft meet strict DoD specification before it is recommended and approved for use.

Table 1-1. Rain Repellent References for Ordering

Part No.	NSN	CAGE Code
MIL-W-006882	6850-00-139-5297	81349
REPCON	6850-00-139-5297	50159
0-79118-40004-0	6850-00-139-5297	50159
2911H-2157E	6850-00-139-5297	98511

1.2 PRODUCT.

The recommended ground applied rain repellent approved for use on all aircraft must meet Specification SAE-AS6882, Water Repellent, Window and Windshield, Glass and Plastic. All manufacturers of rain repellent, with different part numbers, must meet this specification before the supply system links it to the NSN. Table 1-1 lists all the part numbers, which have qualified for production and procurement. All items have been tested to meet the specification requirements and have been found to be non-corrosive to aluminum, magnesium, and steel surfaces. These items will not stress craze or crack acrylic or polycarbonate plastic of the type used in aircraft windshields. For the steps on how to apply the rain repellent see Chapter 2 of this manual for the proper procedures.

CAUTION

- Do not apply the rain repellent to the inside surface of the windshield or canopy for the purpose of preventing fogging and frosting. The treated inside surface would allow moisture to start condensing on the surface forming water droplets. Without the presence of an airstream to remove the water droplets from the surface they would obscure the vision of the aircrew to a greater extent than if the inside surface had not been treated.
- The rain repellent contains flammable isopropyl alcohol. Keep away from fire or other ignition sources.
- This rain repellent is not to be used for removing snow, ice, or frost already on aircraft windshields and windows.

a. This repellent is a liquid material contained and packaged in an 8-ounce plastic bottle. The 8-ounce quantity is sufficient to cover 300 square feet of surface area. For use on exterior aircraft surfaces only, do not apply to interior windows of cockpit.

b. The rain repellent does not affect the aircrew's visibility in clear weather and provides a clear coating, which does not yellow with age. The repellent is equally effective in daylight and darkness providing better visibility in rainy weather. If during night operation the rain droplets are stationary on the windshield, such as would be the case for ground taxi; a distracting glare may result when external lights are directed on the windshield. The same result may occur if cockpit internal lighting is directed on the transparency. This glare is not attributable to the repellent but rather to the water droplets themselves. This effect is not noticeable when the droplets are moving.

CHAPTER 2
APPLYING RAIN REPELLENT

2.1 APPLICATION DETAILS.

The recommended rain repellent material will be applied to all windshields, glass or plastic, on all aircraft not equipped with an in-flight applied rain repellent system. It will also be applied to all other aircraft windows or transparencies. The repellent should be applied or reapplied to a dry clean surface at a temperature between 39°F (4°C) and 90°F (32°C) for best results. The repellent should not be applied on moist surfaces because excessive moisture will cause hydrolysis and condensation of the compound before actual contact with the surface is made.

a. The rain repellent coating reduces the effort required to clean the surface. Use a sponge made of a soft clean cloth soaked with water to remove accumulated dirt and grime on surfaces treated with the repellent.

b. This material reduces ice or frost adhesion, making it easier to remove. It imparts a high degree of electrostatic, reducing surface lubricity, which improves abrasion resistance, restores clarity, and provides added protection against salt spray, sandstorms, and other foreign matter.

c. The repellent should be applied or renewed whenever practical. Flight-testing has shown that the durability of the material depends on the flight conditions and type of aircraft. Frequent windshield wiper use, heavy rain, removal of frost, and high temperature jet blasts are some of the factors, which reduce the useful life of the repellent. Rather than wait for the material to erode, it is recommended that it be reapplied before the previous coating has completely lost its effectiveness.

d. The effectiveness of the repellent on the windshield can be determined by the following procedure: sprinkle water on the coated surface. If the water drops remain high and will not spread, the repellent is still effective. If the water drops flatten out, the repellent has lost its effectiveness and needs renewing.

2.2 APPLYING RAIN REPELLENT.

Insure windshields or other transparencies are clean and dry before treatment. Prior to application of the water repellent to a previously uncoated surface, the glass or acrylic plastic should be cleaned with Aliphatic Naphtha cleaner, TT-N-95. See Table 2-1 for ordering information. It is not necessary to remove previous coatings of the Repcon repellent (See Table 1-1) before re-treating surfaces; previous coatings other than Repcon do need to be removed. To remove partially deteriorated water repellent films use FEDSPECPP-560B. See Table 2-1 for ordering information. The steps for cleaning the surfaces of the glass or acrylic plastic to be coated are similar to the ones used for applying the rain repellent. The Repcon repellent will not build up on itself; if the previous coat has not deteriorated, newly applied repellent will rub off during the polishing. Apply the rain repellent using the following steps.

a. Apply repellent to a small folded clean soft cloth. The cloth should be thoroughly soaked but not dripping wet.

b. Wipe the wet cloth over entire area to be treated, using a circular motion, making sure all areas are coated. The hotter the temperature, the faster the solvent will evaporate, requiring use of more material to complete the surface coating.

c. Allow one-minute minimum for the solvent to evaporate. Use a clean, dry, soft cloth or tissue to wipe the treated surface until all excess repellent is removed and the surface has a clear, smudge-free appearance.

d. Repellent dripped or spilled on the aircraft parts should be wiped up. Although the repellent will not damage other surfaces, prolonged contacts may leave spots.

e. First applications on a previously untreated surface should be repeated.

f. Specialists should wash their hands after applying repellent. Prolonged contact will cause dry skin on exposed skin that has come into contact with repellent.

Table 2-1. Cleaner References for Ordering

Part No.	NSN	CAGE Code
TT-N-95	6810-00-238-8119	81348
FEDSPECPP-560B	7930-00-935-3794	2R240